Forest Sciences

Prince Rupert Forest Region

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Bird Use of a Patch Retention Treatment in SBSmc Forests

Research Issue Groups:

- Forest Biology
- Forest Growth
- Soils
- Wildlife Habitat
- Silviculture
- Ecosystem Inventory and Classification
- Biodiversity
- Ecosystem Management
- Hydrology
- Geomorphology
- Extension

Introduction

The practice of leaving patches of trees within harvested areas ("patch retention") is being advocated as a means of maintaining biodiversity and wildlife habitat values in managed forests (Coates and Steventon 1994). This type of harvest treatment is also known as "clearcut with reserves" (Ministry of Forests 1995a), and is an example of providing wildlife tree patches recommended for stand level biodiversity (Ministry of Forests 1995b).

This note summarizes a survey of bird use of a 21 ha patch retention unit harvested in 1991 by the small business program of the Bulkley Forest District. In this treatment, approximately 10% of the stand volume was left in small clumps or as a fringe along a creek and wetland.

Study Site

The study site is located within the SBSmc2 (moist, cold babine variant) biogeoclimatic variant near McDonnel Lake, approximately 40 km west of Smithers, B.C. Pre-harvest forests were dominated by hybrid spruce (*Picea glauca x engelmanii*), lodgepole pine (*Pinus contorta*) and subalpine fir (*Abies lasiocarpa*), and were approximately 120 years old.

Three treatment units were selected for study: 1) the 21 ha patch retention unit; 2) an adjacent 17 ha clearcut and a second 40 ha clearcut unit approximately 3 km to the west; and 3) an uncut stand adjacent to the patch retention unit. The second clearcut was included as the first appeared to have considerably drier site conditions than the patch retention unit or the uncut stand. All the harvested sites were logged within 6 months of each other.

Methods

Bird use was studied by the "point count" method with nine 50 m radius sample plots established in each of the treatment units. The basic data is a tally of all birds seen or heard in a

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plot over a period of 12 minutes. For the patch retention unit, sample points were systematically placed at least 150 m apart so as to include as much of the variability in the unit as possible. In the more uniform uncut and clearcut units, sample points were placed systematically along transects at 150 m intervals, at least 300 m from the stand edge. At each sample point, ribbons were hung at 25 and 50 m distances in the 4 cardinal directions to aid estimating the direction and distance of bird observations.

Surveys were conducted over a period of 8 weeks from May 14 to July 3, 1991 with 7 surveys completed in the patch retention and uncut stands, and 6 in the clearcut units. Surveys were conducted from sunrise until all plots in the selected unit were surveyed (approximately 10 am). The order in which the units were surveyed was randomly selected for each week. Surveys were not conducted if there were strong winds or heavy rain, due to potential effects on bird activity.

The relative density of each species (with at least 3 or more detections) was calculated for each treatment as the mean number of individuals detected/plot, expressed as detections per 100 ha.

Results

Since this was a reconnaissance level study without replication, only descriptive analyses were conducted. Scientific names of bird species are provided in the appendix.

Species Richness

A total of 43 species were detected during the study. In terms of species richness, the patch retention unit had the highest diversity (35), followed by the uncut stand (26) and the clearcut (19).

Seven species (American Redstart, Dusky Flycatcher, Golden-crowned Sparrow, McGillivray's Warbler, Olive-sided Flycatcher, Pine Grosbeak, and Western Wood-pewee) were recorded only in the patch retention unit. The flycatchers (Olive-sided and Dusky Flycatchers and Western Wood-pewee) forage primarily by hawking, using short flights from a perch to capture flying insects. Habitat for this activity is enhanced by retained trees which provide perches surrounded by open areas suitable for detecting and catching flying insects.

The American Redstart prefers deciduous growth and brushy edges for nesting habitat, and the Pine Grosbeak prefers open conifer forest or conifer forest edge. Such edge environments are enhanced in the patch retention unit. The Golden-crowned Sparrow is an alpine nesting species, and was only detected early in the season.

Three species (Brown Creeper, Pileated Woodpecker, and Spruce Grouse) were recorded only in the uncut stand. These are all species normally associated with mature forest cover. There were, however, few detections of these 3 species which are usually found in low densities.

Three species were detected only in the clearcut (Cedar Waxwing, Western Tanager, and Winter Wren). A Winter Wren was detected only twice in a sample plot, but was heard singing frequently along a small creek on the edge of the clearcut. The detections in the clearcut were likely foraging activity, with nesting in the adjacent forest. The other two species were detected only once early in the season and were almost certainly migrating, rather than resident at the study site.

Abundance

The density of all species combined in the patch retention unit was more than twice that in the clearcut (947 and 411 detections /100 ha respectively) and higher than the uncut block (702 detections /100 ha). The accompanying graphs show for each treatment the mean and standard deviation of the number of detections, listed in order of species abundance. The clearcuts tended to be dominated by a few very abundant species, while the patch retention unit and uncut forest had a more even community structure. Two species (Dark-eyed Junco and Song Sparrow) made up over half of the total number of birds observed in the clearcuts, whereas 5 species accounted for 50% in the patch retention unit, and 4 species accounted for 50% in the uncut forest.

Of note were the high numbers of Blackpoll, Yellow-rumped, and Townsend's warblers in the patch retention block. This may have been due to the greater abundance of fresh

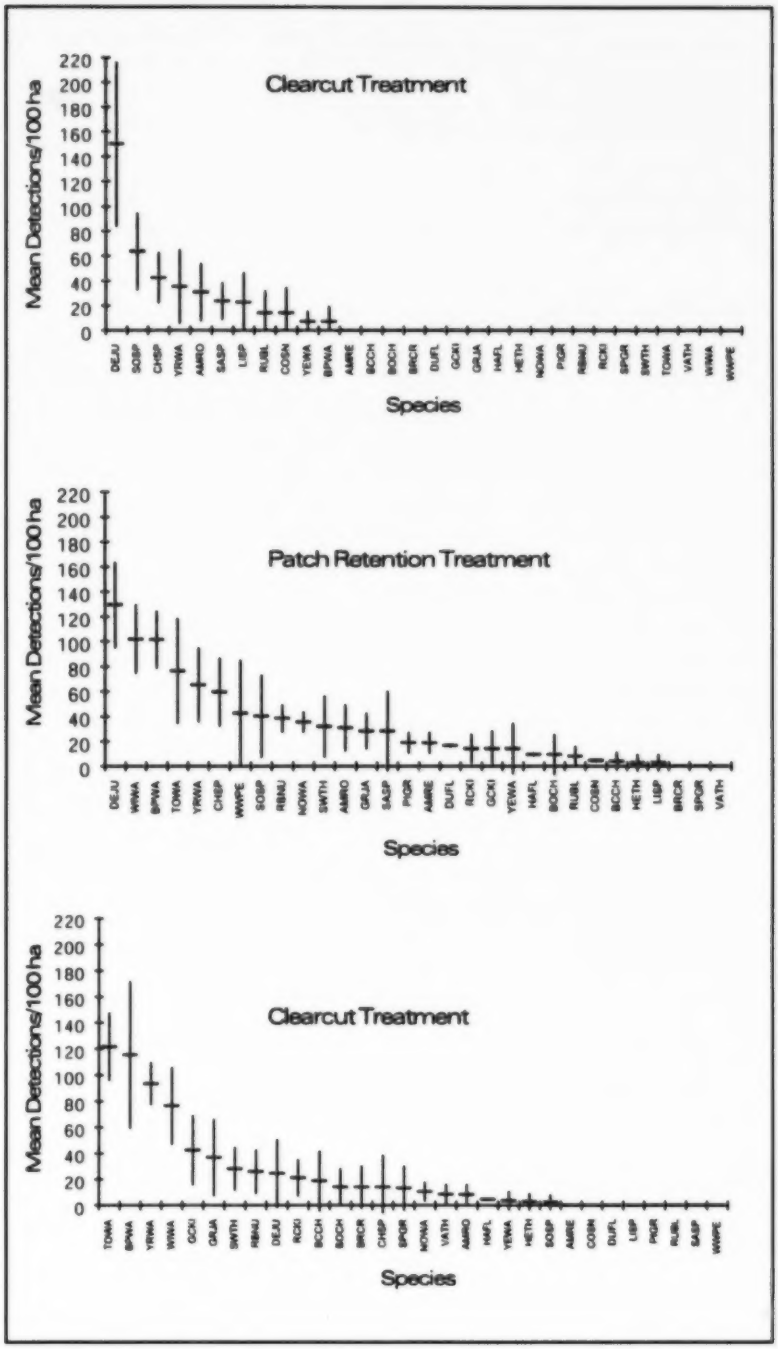

Figure 1. Mean and standard error of detections per 100 hectares for the three treatment areas.

slash harbouring greater insect food resources. In following years, when the slash has dried and settled, this food source may not be available and the long-term suitability of the patch retention unit may not be as great as the data suggest for those species.

Conclusions

The patch retention unit attracts both a greater overall abundance and species richness of birds than either the uncut or the clearcut stands. There were almost twice as many species in the patch retention unit as compared to the clearcuts, and most species common to both treatments were more abundant in the retention unit. This is not unexpected, as the presence of standing trees provides perching, nesting, and foraging substrates not found in the clearcuts.

Many of the benefits of patch retention treatments are expected to be long term (Coates and Steventon 1994). The results of this limited study, however, support the observations of many other studies that there is also an immediate positive influence on bird communities.

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Appendix: List of Species and Species codes

Species Code	Common Name	Scientific Name
AMPI	American Pipit	*(Anthus spinoletta)*
AMRE	American Redstart	*(Setophaga ruticilla)*
AMRO	American Robin	*(Turdus migratorius)*
BCCH	Black-capped Chickadee	*(Parus atricapillus)*
BOCH	Boreal Chickadee	*(Parus hudsonicus)*
BPWA	Blackpoll Warbler	*(Dendroica striata)*
BRCR	Brown Creeper	*(Certhia americana)*
CEWA	Cedar Waxwing	*(Bombycilla cedrorum)*
CHSP	Chipping Sparrow	*(Spizella passerina)*
COSN	Common Snipe	*(Gallinago gallinago)*
COYE	Common Yellowthroat	*(Geothlypis trichas)*
DEJU	Dark-eyed Junco	*(Junco hyemalis)*
DUFL	Dusky Flycatcher	*(Empidonax oberholseri)*
GCKI	Golden-crowned Kinglet	*(Regulus satrapa)*
GCSP	Golden-crowned Sparrow	*(Zonotrichia atricapilla)*
GRJA	Gray Jay	*(Perisoreus canadensis)*
HAFL	Hammond's Flycatcher	*(Empidonax hammondii)*
HETH	Hermit Thrush	*(Catharus guttatus)*
LISP	Lincoln's Sparrow	*(Melospiza lincolnii)*
MGWA	MacGillivray's Warbler	*(Oporornis tolmiei)*
NOWA	Northern Waterthrush	*(Seiurus noveboracensis)*
NOFL	Northern Flicker	*(Colaptes auratus)*
OSFL	Olive-sided Flycatcher	*(Contopus borealis)*
PIGR	Pine Grosbeak	*(Pinicola enucleator)*
PISI	Pine Siskin	*(Carduelis pinus)*
PIWO	Pileated Woodpecker	*(Dryocopus pileatus)*
RBNU	Red-breasted Nuthatch	*(Sitta canadensis)*
RCKI	Ruby-crowned Kinglet	*(Regulus calendula)*
RUBL	Rusty Blackbird	*(Euphagus carolinus)*
SASP	Savannah Sparrow	*(Passerculus sandwichensis)*
SOSA	Solitary Sandpiper	*(Tringa solitaria)*
SOSP	Song Sparrow	*(Melospiza melodia)*
SPGR	Spruce Grouse	*(Dendragapus canadensis)*
SWTH	Swainson's Thrush	*(Catharus ustulatus)*
TOWA	Townsend's Warbler	*(Dendroica townsendi)*
TTWO	Three-toed Woodpecker	*(Picoides tridactylus)*
VATH	Varied Thrush	*(Ixoreus naevius)*
WETA	Western Tanager	*(Piranga ludoviciana)*
WWPE	Western Wood-pewee	*(Contopus sordidulus)*
WIWA	Wilson's Warbler	*(Wilsonia pusilla)*
WIWR	Winter Wren	*(Troglodytes troglodytes)*
YEWA	Yellow Warbler	*(Dendroica petechia)*
YRWA	Yellow-rumped Warbler	*(Dendroica coronata)*

References Cited

Ministry of Forests, 1995a. Silvicultural systems guidebook. B.C. Min. For., Victoria, B.C.

Ministry of Forests, 1995b. Biodiversity guidebook. B.C. Min. For., Victoria, B.C.

Coates, K.D. and J.D. Steventon 1994. Principles of patch retention harvesting. B.C. Min. For., Smithers, B.C., Res. Ext. Note #2.